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PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 02 March 2001 (02.03.01)	
International application No. PCT/NL00/00428	**Applicant's or agent's file reference** P53579PC00
International filing date (day/month/year) 20 June 2000 (20.06.00)	**Priority date** (day/month/year) 21 June 1999 (21.06.99)
Applicant BRAMER, Albertus, Maria et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

22 January 2001 (22.01.01)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Ingrid Aulich

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Copy for the Elected Office (EO/US)

PCT/NL00/00428

PATENT COOPERATION TREATY

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NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

PRINS, A., W.
Vereenigde
Nieuwe Parklaan 97
NL-2587 BN The Hague
PAYS-BAS

Date of mailing (day/month/year)
02 April 2001 (02.04.01)

Applicant's or agent's file reference
P53579PC00

IMPORTANT NOTIFICATION

International application No.
PCT/NL00/00428

International filing date (day/month/year)
20 June 2000 (20.06.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

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2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

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Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:
CORRECTED VERSION OF NOTIFICATION MAILED ON 29 jANUARY 2001 (29.01.01).

4. A copy of this notification has been sent to:

[X] the receiving Office
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[X] the International Preliminary Examining Authority
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[ ] other:

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PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

PRINS, A., W.
Vereenigde
Nieuwe Parklaan 97
NL-2587 BN The Hague
PAYS-BAS

Date of mailing (day/month/year) 29 January 2001 (29.01.01)	
Applicant's or agent's file reference P53579PC00	**IMPORTANT NOTIFICATION**
International application No. PCT/NL00/00428	**International filing date** (day/month/year) 20 June 2000 (20.06.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

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	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

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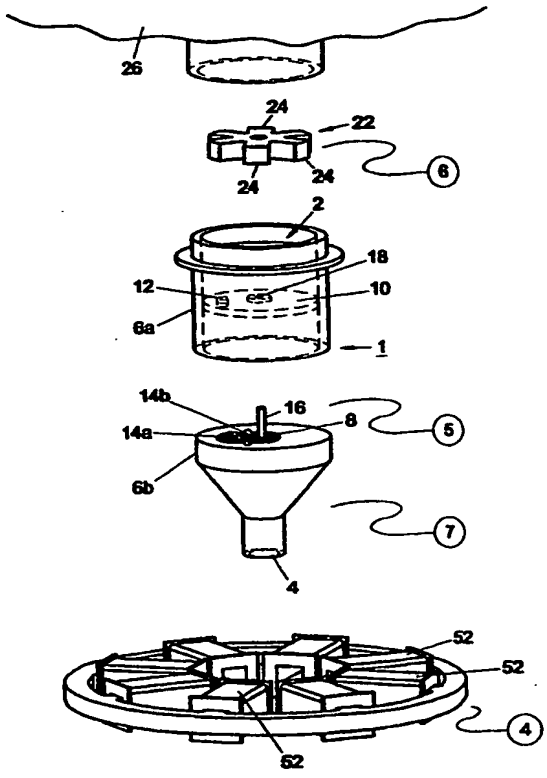
(54) Title: DOSING DEVICE ADAPTED FOR DISPENSING A CONCENTRATE FROM A HOLDER IN A METERED MANNER



(57) Abstract: The invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, and a liquid flow path extending from the inlet to the outlet. The dosing device is adapted for dispensing in a metered manner a viscous concentrate from a holder. The concentrate in diluted condition forms a beverage suitable for consumption. The dosing device is adapted to be connected, in use, to a storage space of the holder. According to the invention, the dosing device comprises a gear pump to be included in the liquid flow path, which gear pump can be driven in particular by a rotor located upstream of the gear pump, by means of changing magnetic fields.

WO 00/79223 A2

patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Title: Dosing device adapted for dispensing a concentrate from a holder in a metered manner.

This invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder.

Such a device is known from British patent application 2103296. The dosing device described therein comprises a hollow cylinder-shaped body manufactured from a flexible elastic material. The body in question encloses a pumping volume. Further, the device comprises an operating element for compressing the body in an axial direction. The device also comprises a hollow cylinder-shaped housing which is adapted to encompass said body on its outer side at least during the phase in which the pumping volume is reduced. The flexible body is cyclically deformed in an axial direction, with the result that in each cycle a predetermined amount of extract is dispensed. To that end, the operating element is driven by means of a pulsating magnetic field. For driving the operating element, the dosing device is placed in a unit for generating a pulsating magnetic field. In a pulsating magnetic drive, the position of the dosing device with respect to the unit in axial direction of the dosing device is of great influence on the power to be supplied. This makes placing the dosing device in the unit very critical.

Further, the known dosing device has as a disadvantage that its action is dependent on the viscosity of the concentrate.

The object of the invention is to provide an improved dosing device. To that end, the dosing device according to the invention is characterized in that the pump comprises a gear pump.

As the dosing device comprises a gear pump included in the liquid flow path, it is no longer necessary, as in the known device, to utilize a pulsating drive. Because a pulsating drive can be omitted, the placement of the dosing device in a dispensing machine is no longer critical. A further advantage is that in the diluted form of the concentrate, the so-called zebra effect does not arise because the concentrate is not dispensed in a pulsating manner.

Further, by virtue of the gear pump, the dosing device can be of economically advantageous construction.

A further advantage of the device according to the invention is that metering can be set steplessly. Furthermore, the gear pump can be arranged such that the rotation axis of each gear pump is directed approximately parallel to the direction of the liquid flow path. Such a construction is easy to realize. Moreover, the dosing device can be designed with small overall dimensions.

According to a more advanced embodiment, the dosing device is provided, upstream of the gear pump, with a rotor mechanically connected to the gear pump, for driving the gear pump using a changing magnetic field. Preferably the rotor is connected to the drive shaft for driving the gear pump.

An advantage is that the rotor can be included in the liquid flow path, so that this also obtains the function of stirrer. In particular, the dosing device is driven by a drive shaft of which an axial axis is directed in the direction from the inlet to the outlet. As a dynamic liquid sealing of the drive shaft can be omitted, there is relatively little energy loss and there is a very small chance of leakage or contamination. A further advantage is that

the concentrate remaining behind in the dosing device after use is hermetically sealed from the outside world.

What is also achieved by virtue of the specific direction of the drive shaft is that the dosing device can be placed in a dispensing machine rotation-independently. The position of the rotor is not critical then. If the dosing device is connected to a holder filled with the concentrate, this connection can likewise be effected rotation-independently.

According to the preferred embodiment, the dosing device comprises a substantially rotation-symmetrical housing of which an axial axis extends in the direction from the inlet to the outlet. In particular, the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value. The use of a gear pump in combination with a pressure relief valve has the advantage that no leakage flow owing to internal play arises in the non-driven condition. Moreover, the valve provides for a microbiological sealing, which is important for beverages suitable for consumption.

The holder according to the invention is characterized in that it is filled with the concentrate which in diluted condition is suitable for consumption, the holder being fitted with a dosing device according to the invention as described hereinbefore.

As the dosing device according to the invention, viewed in axial direction, can be made of low design, less length, viewed in this direction, is needed for driving than in the known linear magnet. This creates the possibility of making the dosing device extendible instead of foldable, so that a tearing strip in the holder, when it is designed as a so-called bag in box, can be omitted. This provides the advantage that making the bag in box operational involves a simpler operation. In particular, accordingly, the holder is provided with a bag formed from flexible sheetlike material, in

which the concentrate is contained, and a housing in which the bag is accommodated.

The invention also relates to an apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be charged with a holder as mentioned hereinbefore. The apparatus comprises a magnetization unit for generating at least one magnetic field which changes so as to drive the rotor to allow the dosing device to dispense concentrate from the holder in a metered manner. The apparatus further comprises means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption. The magnetization unit can be provided with a magnet and driving means for rotating a magnet for generating the changing magnetic field. It is also possible, however, that the magnetization unit is provided with a plurality of coils for generating the changing magnetic field. The invention also relates to an assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder as described hereinbefore. The apparatus is adapted to be loaded with the holder, the apparatus comprising driving means for driving the dosing device to cause the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

The invention will presently be further explained with reference to the drawings, in which:

Fig. 1 shows an exploded view of a possible embodiment of a dosing device according to the invention, which is connected to a holder according to the invention. Fig. 1 also shows a magnetization unit of an apparatus for preparing a beverage suitable for consumption;

Fig. 2 shows a number of parts of the dosing device according to Fig. 1;

Fig. 3 shows a number of parts of the dosing device and the apparatus for preparing a beverage suitable for consumption according to Fig. 1;

Fig. 4a shows a top plan view of the gear pump of the dosing device according to Fig. 1;

Fig. 4b shows a cross section of the dosing device according to Fig. 1 which is placed in the magnetization unit of Fig. 1;

Fig. 5a shows a top plan view of the dosing device according to Fig. 1 which is placed in the magnetization unit according to Fig. 1;

Fig. 5b shows a view of the dosing device according to Fig. 1 which is placed in the magnetization unit according to Fig. 1; and

Fig. 6 shows a holder with a dosing device according to the invention, an apparatus for preparing a beverage suitable for consumption according to the invention, and an assembly comprising the apparatus and the holder according to the invention.

In Figs. 1-6, reference numeral 1 indicates a dosing device according to the invention. The dosing device comprises an inlet 2 and at least one outlet 4.

The liquid flow path extends from the inlet 2 to the outlet 4. In this example, the dosing device comprises a housing 6a and 6b composed of two parts, which is rotation-symmetrical around an axis which is directed in the direction of the liquid flow path.

In the housing 6a, 6b, a gear pump 8 is included. At the top, the gear pump 8 comprises a covering plate 10 having an inflow opening 12. The inflow opening 12 is in fluid communication with a space where the teeth of, in this case two, gearwheels 14a and 14b mesh. The gearwheel 14b is driven by a drive shaft 16 which in mounted condition extends through an opening 18 of the covering plate 10. The drive shaft 16 can be driven directly by means of an external drive, for rotation of the gear pump. The gear pump 8 is provided at its underside with an outflow opening 20 for dispensing

liquid. The drive shaft 16 is so directed that an axial axis of this drive shaft is directed in the direction from the inlet 2 to the outlet 4. In this example, the housing 6a, 6b is designed to be substantially rotation-symmetrical around the axial axis, likewise extending in the direction from the inlet 2 to the outlet 4.

In this example, however, the dosing device is provided, upstream of the gear pump 8, with a rotor 22 connected mechanically with the gear pump, in this example connected mechanically with the rotary shaft 16. In mounted condition, this rotor 22 is disposed above the covering plate 10. The rotor can be driven by means of an external drive for rotating the gear pump 8. Preferably, the rotor is adapted to be driven by means of a changing magnetic field, for the purpose of driving the gear pump 8.

In this example it holds, further, that the rotor 22 is included in the liquid flow path mentioned. In this example, the rotor is provided with a permanent magnet for contactlessly driving the rotor by means of at least one varying magnetic field. In particular it holds, in this example, that the rotor comprises a plurality of arms 24 extending in radial direction of the rotation axis (drive shaft 16). More particularly, there are only two arms, disposed in line with each other and hence forming a beamlike body. The ends of the arms form poles of the permanent magnet mentioned. The poles of the permanent magnet will want to follow the changing magnetic field, which has as a result that the rotor and the drive shaft 16 will start to rotate. The device described up to this point works as follows. Suppose that the inlet 2 of the dosing device is connected to a holder 26, shown schematically in Figs. 1 and 6, in which an amount of concentrate, such as, for instance, coffee concentrate, is present. The holder 26, as shown best in Fig. 6, is fitted with the dosing device according to Fig. 1. In this example, the holder 26 includes a bag 28 (indicated by broken lines), formed by a flexible sheetlike material, in which the concentrate is contained, and a housing 30 in which the bag 28 is accommodated. The housing 30 is

preferably made of substantially rigid design and hence is more rigid than the bag 28. The inlet 2 of the dosing device is in fluid communication with the inside of the bag 28. By presently generating a magnetic field changing in a predetermined manner, the rotor 22 will start to rotate in a predetermined manner. As a consequence, the gear pump 8 will likewise start to rotate, with the result that concentrate flows via the inflow opening 12 and the space between the teeth of the gearwheels to the outflow opening 20 mentioned. Thus the amount of concentrate dispensed in a metered manner corresponds with the angle of rotation through which the rotor 22 is rotated. The relation is substantially linear.

In Fig. 6, reference numeral 31 designates an apparatus for preparing a beverage suitable for consumption. The apparatus 31 is adapted to be loaded with the holder 26. The apparatus 31 comprises a magnetization unit 32 for generating the changing magnetic field referred to for driving the rotor. Further, the apparatus comprises means 34 for diluting the concentrate dispensed by the dosing device 1 with water. These means 34 comprise a hot water generator 36 and a mixing unit 38. In use, the housing 6a, 6b of the dosing device is inserted through an opening 40 of the magnetization device, such that the outlet 4 of the dosing device reaches into an opening 42 of the mixing device 38. A control unit 44 of the apparatus 31 controls the magnetization unit 32 via line 45, such that a changing magnetic field is generated which causes the rotor 22 to rotate through a predetermined angle of rotation. As a result, from the holder 26 a predetermined amount of concentrate is dispensed to the mixing device 38. The control unit 44 also activates the hot water unit 36 and the mixing unit 38 via respective electrical lines 46 and 48. As a result, hot water is sent from the hot water unit 36 to the mixing unit 38. In the mixing unit, the hot water is mixed with the dispensed concentrate, after which the concentrate, in diluted condition and hence in the condition of a beverage suitable for consumption, leaves an outlet opening 50 of the apparatus 31.

In this example, the magnetization unit 32 comprises a plurality of coils 52 for generating the changing magnetic field.

The invention is not limited in any way to the embodiments outlined hereinabove. Thus, the rotor 22 may also be provided exclusively with soft iron. Magnetization of the rotor is then effected by the magnetic field of the magnetization unit 31. The rotor will want to orient in this changing magnetic field, so that the rotation is effected. The rotor 22 may also be driven, in a manner known per se, as is known for an eddy current motor. Upon rotation of the rotor, fly-back pulses arise in the coils 52 of the magnetization device which are not energized. These fly-back pulses can be utilized in the magnetization device in a manner known per se to determine the rotational position of the rotor. On the basis of this rotational position, a (feedback) control configuration known per se can be utilized.

It is also possible that the coils 52 are replaced by permanent magnets, these magnets being mechanically rotated for generating the changing magnetic field.

Further, in the outflow opening 20 referred to, a valve 54 may be included which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value. This involves a so-called non-return valve comprising a shut-off member 56 with a spring 58 which is schematically shown in this example.

In this example, the housing 6a and 6b is made of a suitable plastic. The gearwheels 14a and 14b and the drive shaft 16 are also made of plastic. The only metal part is therefore the rotor 22. It is also possible that the rotor is included in the liquid flow path downstream of the gear pump. The gear pump, instead of being driven by means of the rotor, can also be driven in a different manner. Thus, the gear pump can also be driven mechanically, by means of, for instance, a motor. This motor can then be a part of the apparatus 31. The valve 54 can also be designed as a so-called

step valve. Such variants are all understood to fall within the scope of the invention.

CLAIMS

1. A dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder, characterized in that the pump comprises a gear pump.

2. A dosing device according to claim 1, characterized in that the gear pump is driven by a drive shaft of which an axial axis extends in a direction from the inlet to the outlet .

3. A dosing device according to claim 1 or 2, characterized in that the housing of the dosing device is of substantially rotation-symmetrical design, with an axial axis of the housing extending in the direction from the inlet to the outlet.

4. A dosing device according to any one of the preceding claims, characterized in that the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value.

5. A dosing device according to any one of the preceding claims, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor.

6. A dosing device according to claims 2 and 5, characterized in that the rotor is connected to the drive shaft for driving the gear pump.

7. A dosing device according to claim 5 or 6, characterized in that the rotor is included in the liquid flow path.

8. A dosing device according to claim 7, characterized in that the rotor is included in the liquid flow path upstream of the gear pump.

9. A dosing device according to any one of claims 5-8, characterized in that the rotor is provided with a magnetizable material such as soft iron.

10. A dosing device according to any one of claims 5-9, characterized in that the rotor comprises a permanent magnet for contactlessly driving the rotor by means of at least one changing magnetic field.

11. A dosing device according to any one of claims 5-10, characterized in that the rotor comprises a plurality of arms extending in radial direction of the rotation axis.

12. A dosing device according to claims 10 and 11, characterized in that the ends of the arms form poles of the permanent magnet.

13. A holder filled with concentrate which in diluted form is suitable for consumption, the holder comprising a dosing device according to any one of the preceding claims.

14. A holder according to claim 13, characterized in that the holder comprises a bag formed from a flexible sheetlike material in which the concentrate is contained, and a housing in which the bag is received.

15. A holder according to claim 14, characterized in that the inlet of the dosing device is connected to the bag.

16. A holder according to any one of claims 13-15, characterized in that the housing is of more rigid design than the bag.

17. An apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be loaded with a holder according to any one of the preceding claims 13-16 which is fitted with a dosing device according to any one of claims 5-12, the apparatus comprising a magnetization unit for

generating at least one magnetic field changing such that the rotor is contactlessly driven by the magnetization unit for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

18. An apparatus according to claim 17, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

19. An apparatus according to claim 17, characterized in that the magnetization unit comprises a plurality of coils.

20. An assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder according to any one of the preceding claims 13-16, the apparatus being loaded with the holder, and the apparatus comprising driving means for driving the dosing device for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

21. An assembly according to claim 20, characterized in that the holder is detachably connected to the apparatus.

22. An assembly according to claim 20 or 21, wherein the holder comprises a dosing device according to any one of claims 5-12, characterized in that the apparatus further comprises a magnetization unit for generating at least one magnetic field changing such that the rotor is driven for causing the dosing device to dispense concentrate from the holder..

23. An assembly according to claim 22, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

24. An assembly according to claim 22, characterized in that the magnetization unit comprises a plurality of coils.

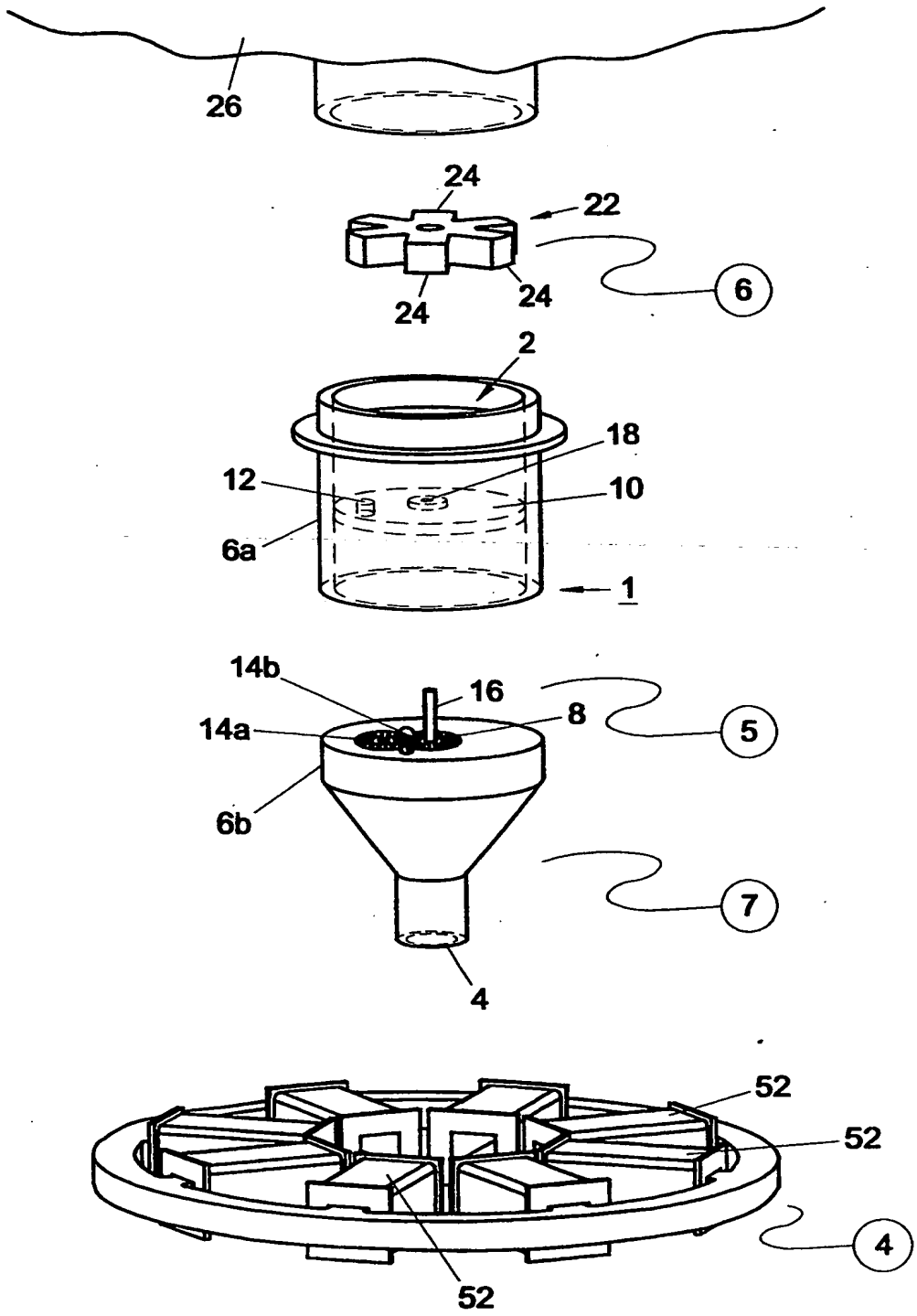

Fig. 1

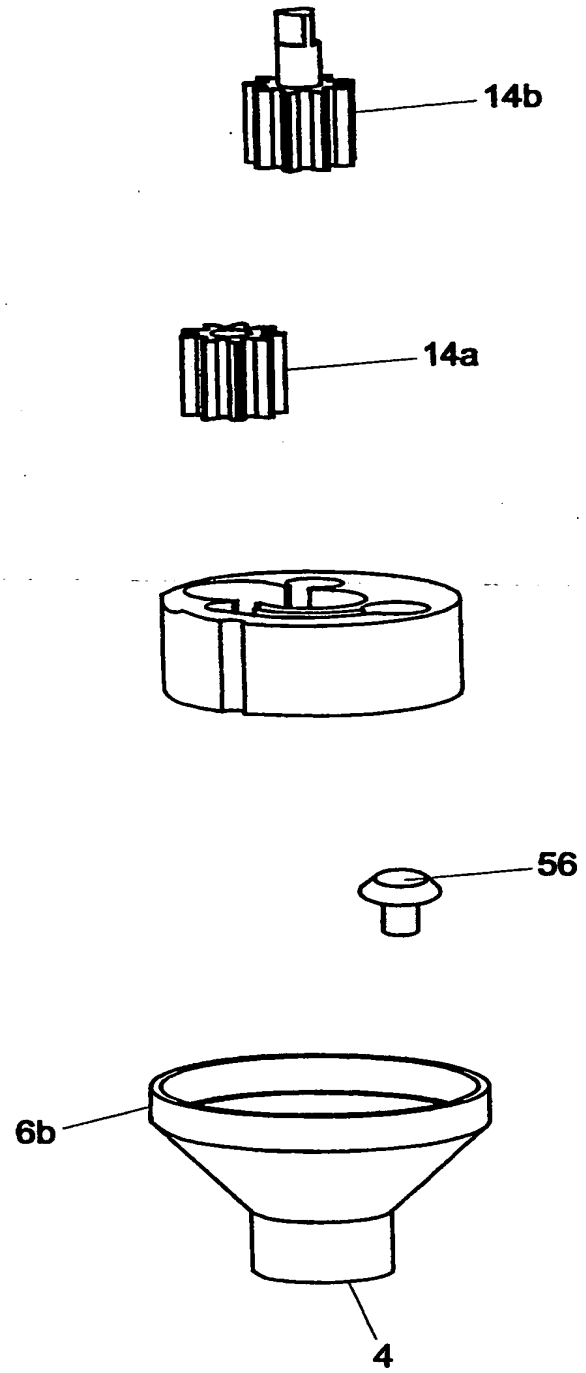

Fig. 2

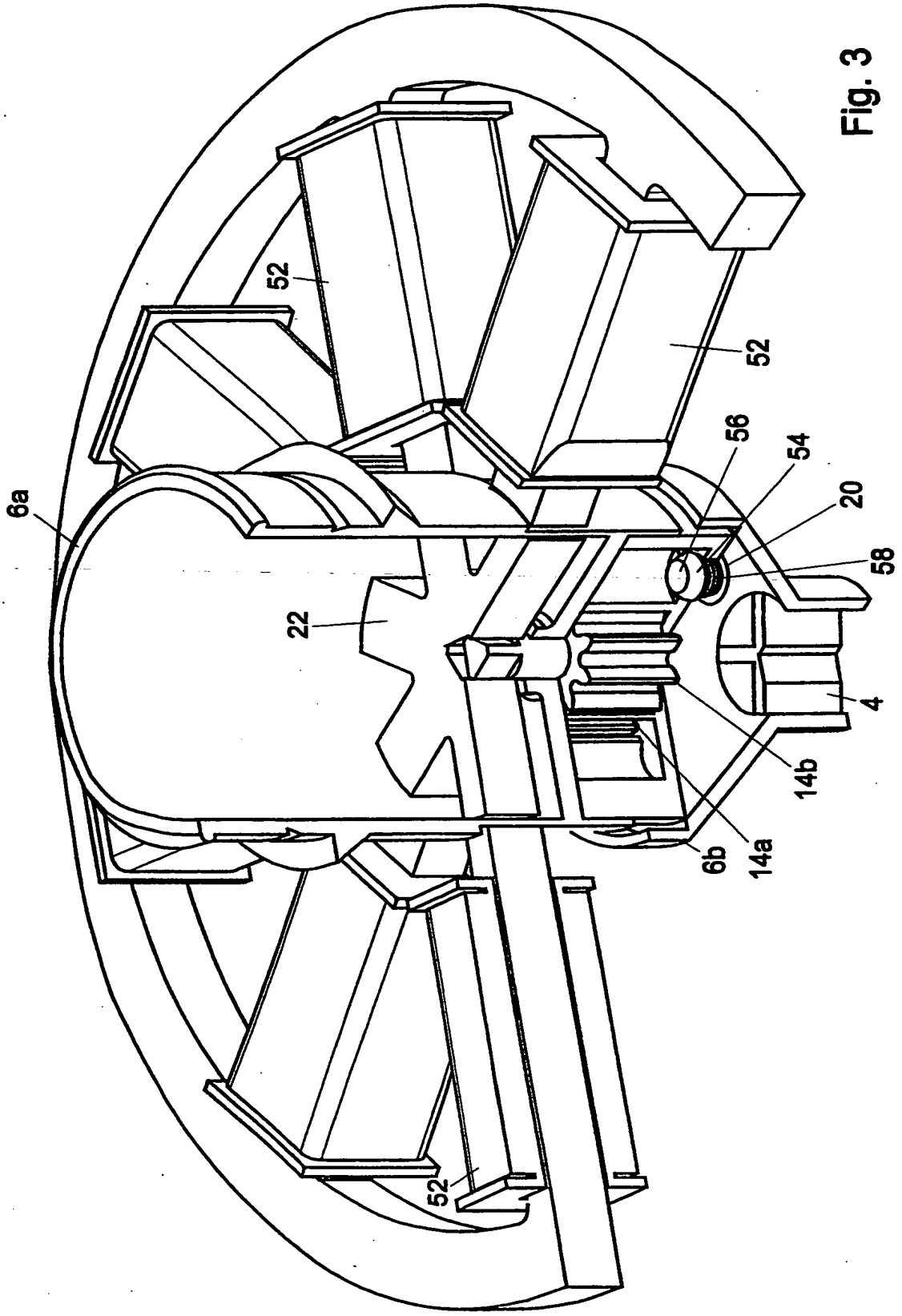

Fig. 3

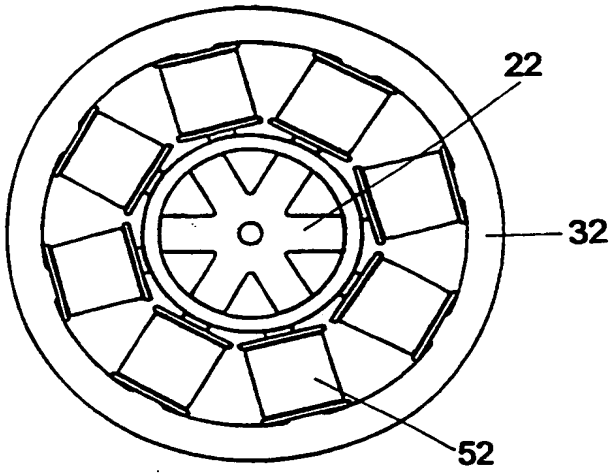

Fig. 5a

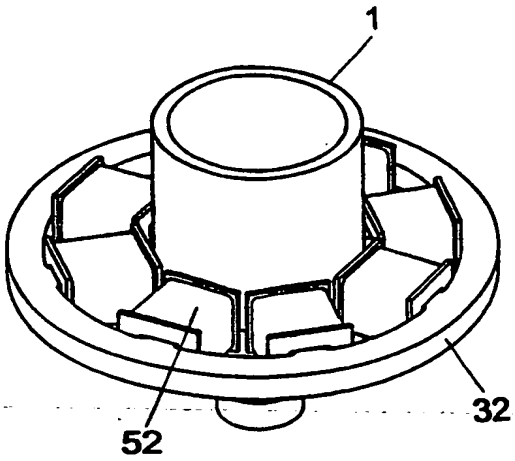

Fig. 5b

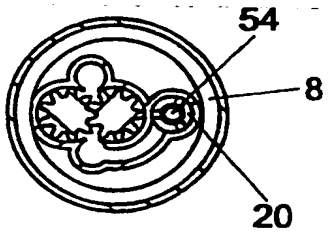

Fig. 4a

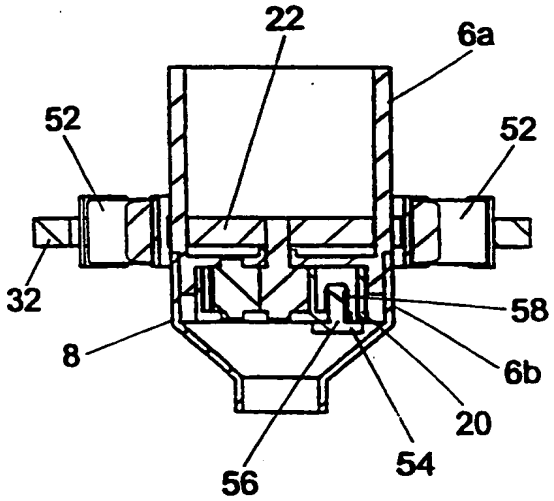

Fig. 4b

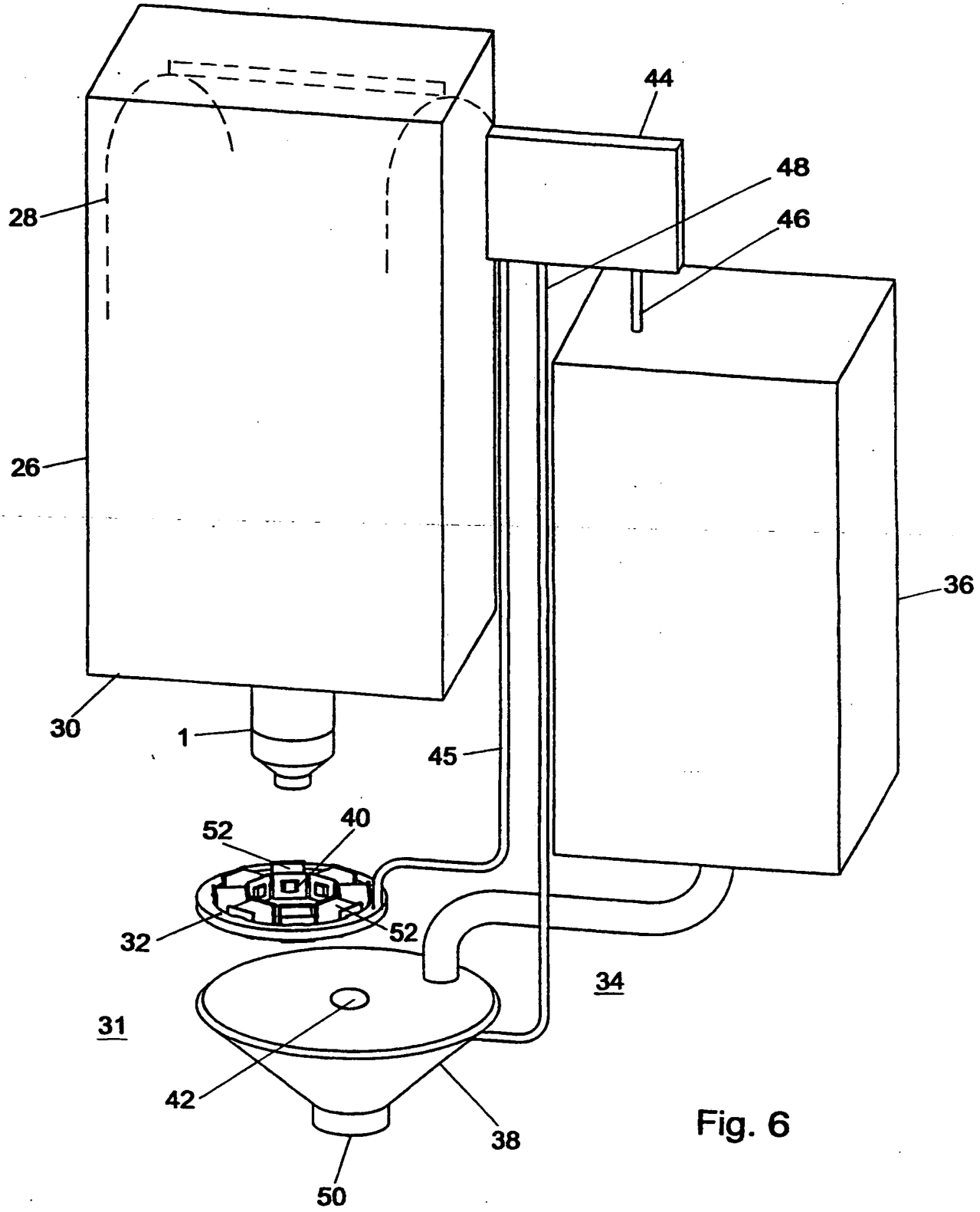

Fig. 6

CMJ P53578PC00

Title: Dosing device adapted for dispensing a concentrate from a holder in a metered manner.

This invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being suitable for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder, wherein the pump comprises a gear pump.

Such a device is known from US patent 5,836,482. In this known device the shaft for driving the gear pump extends in a direction perpendicular to the direction from the inlet to the outlet. This has the disadvantage that a combination of the device and a motor for driving the drive shaft becomes rather bulky, especially in the direction of the driving shaft. An object of the invention is to provide a solution which enables to avoid this problem. To that end, the dosing device according to the invention is characterized in that the gear pump is driven by a drive shaft of which an axial axis extends in a direction from the inlet to the outlet.

Because the drive shaft extends in a direction from the inlet to the outlet the device in combination with means for driving the drive shaft may be designed to have overall small dimensions. Furthermore such a construction is easy realize.

British patent application 2103296 discloses a dosing device comprises a hollow cylinder-shaped body manufactured from a flexible elastic material. The body in question encloses a pumping volume. Further, the device comprises an operating element for compressing the body in an

axial direction. The device also comprises a hollow cylinder-shaped housing which is adapted to encompass said body on its outer side at least during the phase in which the pumping volume is reduced. The flexible body is cyclically deformed in an axial direction, with the result that in each cycle a predetermined amount of extract is dispensed. To that end, the operating element is driven by means of a pulsating magnetic field. For driving the operating element, the dosing device is placed in a unit for generating a pulsating magnetic field. In a pulsating magnetic drive, the position of the dosing device with respect to the unit in axial direction of the dosing device is of great influence on the power to be supplied. This makes placing the dosing device in the unit very critical.

This known dosing device has as a disadvantage that its action is dependent on the viscosity of the concentrate. The dosing device does not comprise a gear pump.

As the dosing device according to the invention comprises a gear pump included in the liquid flow path, it is no longer necessary, as in the device known from the British patent application 2 103 296, to utilize a pulsating drive. Because a pulsating drive can be omitted, the placement of the dosing device in a dispensing machine is no longer critical. A further advantage is that in the diluted form of the concentrate, the so-called zebra effect does not arise because the concentrate is not dispensed in a pulsating manner.

US patent 4,334,690 and EP-067 466 each disclose a dosing device comprising a dispensing tube which is squeezed so as to force a quantity of concentrate through the dispersing end of the tube.

Further, by virtue of the gear pump, the dosing device can be of economically advantageous construction.

A further advantage of the device according to the invention is that metering can be set steplessly.

-see further page 2, lines 19 ff. of the original specification --

New claims

1. A dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being suitable for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder, wherein the pump comprises a gear pump, characterized in that the gear pump is driven by a drive shaft of which an axial axis extends in a direction from the inlet to the outlet .

2. A dosing device according to claim 1, characterized in that the gear wheels of the gear pump are arranged to rotate around axes extending in a direction from the inlet to the outlet.

3. A dosing device according to claim 1 or 2, characterized in that the housing of the dosing device is of substantially rotation-symmetrical design, with an axial axis of the housing extending in the direction from the inlet to the outlet.

4. A dosing device according to any one of the preceding claims, characterized in that the dosing device is provided, downstream of the gear pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value.

5. A dosing device according to any one of the preceding claims, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of at least one changing magnetic field, the

rotor being mechanically connected to the gear pump for driving the gear pump with the rotating rotor.

6. A dosing device according to claim 5, characterized in that the rotor is connected to the drive shaft for driving the gear pump.

7. A dosing device according to claim 5 or 6, characterized in that the rotor is included in the liquid flow path.

8. A dosing device according to claim 7, characterized in that the rotor is included in the liquid flow path upstream of the gear pump.

9. A dosing device according to any one of claims 5-8, characterized in that the rotor is provided with a magnetizable material such as soft iron.

10. A dosing device according to any one of claims 5-9, characterized in that the rotor comprises a permanent magnet for contactlessly driving the rotor by means of at least one changing magnetic field.

11. A dosing device according to any one of claims 5-10, characterized in that the rotor comprises a plurality of arms extending in radial direction of the rotation axis.

12. A dosing device according to claims 10 and 11, characterized in that the ends of the arms form poles of the permanent magnet.

13. A holder filled with concentrate which in diluted form is suitable for consumption, the holder comprising a dosing device according to any one of the preceding claims.

14. A holder according to claim 13, characterized in that the holder comprises a bag formed from a flexible sheetlike material in which the concentrate is contained, and a housing in which the bag is received.

15. A holder according to claim 14, characterized in that the inlet of the dosing device is connected to the bag.

16. A holder according to any one of claims 13-15, characterized in that the housing is of more rigid design than the bag.

17. An apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be loaded with a holder according to any one of the

preceding claims 13-16 which is fitted with a dosing device according to any one of claims 5-12, the apparatus comprising a magnetization unit for generating at least one magnetic field changing such that the rotor is contactlessly driven by the magnetization unit for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

18. An apparatus according to claim 17, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

19. An apparatus according to claim 17, characterized in that the magnetization unit comprises a plurality of coils.

20. An assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder according to any one of the preceding claims 13-16, the apparatus being loaded with the holder, and the apparatus comprising driving means for driving the dosing device for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

21. An assembly according to claim 20, characterized in that the holder is detachably connected to the apparatus.

22. An assembly according to claim 20 or 21, wherein the holder comprises a dosing device according to any one of claims 5-12, characterized in that the apparatus further comprises a magnetization unit for generating at least one magnetic field changing such that the rotor is driven for causing the dosing device to dispense concentrate from the holder.

23. An assembly according to claim 22, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

24. An assembly according to claim 22, characterized in that the magnetization unit comprises a plurality of coils.

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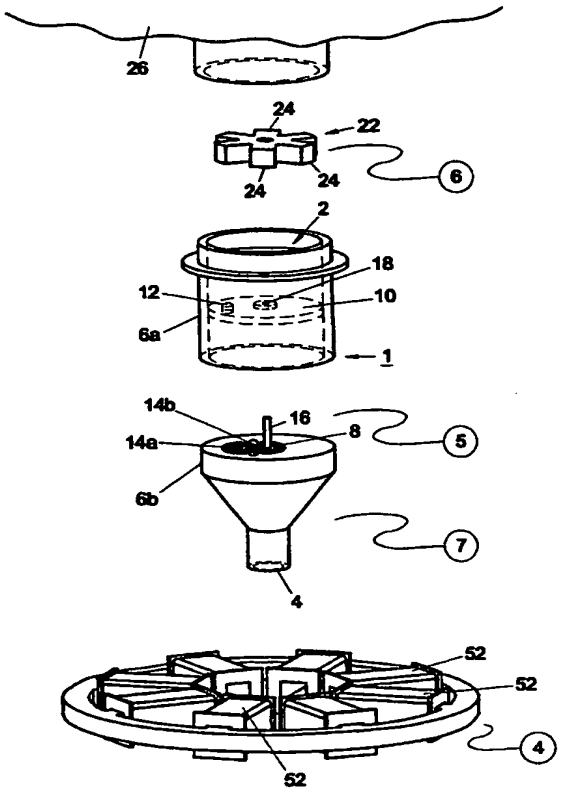
(54) Title: DOSING DEVICE ADAPTED FOR DISPENSING A CONCENTRATE FROM A HOLDER IN A METERED MANNER



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(57) Abstract: The invention relates to a dosing device comprising a housing comprising at least one inlet, at least one oulet. The dosing device is adapted for dispensing in a metered manner a viscous concentrate from a holder. The concentrate in diluted condition forms a beverage suitable for consumption. The dosing device is adapted to be connected, in use, to a storage space of the holder. According to the invention, the dosing device comprises a rotor connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of a changing magnetic field, the rotor being mechanically connected to the pump for driving the pump with the rotation rotor.

Title: Dosing device adapted for dispensing a concentrate from a holder in a metered manner.

This invention relates to a dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder.

Such a device is known from British patent application 2103296. The dosing device described therein comprises a hollow cylinder-shaped body manufactured from a flexible elastic material. The body in question encloses a pumping volume. Further, the device comprises an operating element for compressing the body in an axial direction. The device also comprises a hollow cylinder-shaped housing which is adapted to encompass said body on its outer side at least during the phase in which the pumping volume is reduced. The flexible body is cyclically deformed in an axial direction, with the result that in each cycle a predetermined amount of extract is dispensed. To that end, the operating element is driven by means of a pulsating magnetic field. For driving the operating element, the dosing device is placed in a unit for generating a pulsating magnetic field. In a pulsating magnetic drive, the position of the dosing device with respect to the unit in axial direction of the dosing device is of great influence on the power to be supplied. This makes placing the dosing device in the unit very critical.

Further, the known dosing device has as a disadvantage that its action is dependent on the viscosity of the concentrate. A further disadvantage is that the dosing device is relatively expensive.

The object of the invention is to provide an improved dosing device. To that end, the dosing device according to the invention is characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of a changing magnetic field, the rotor being mechanically connected to the pump for driving the pump with the rotating rotor.

As the dosing device comprises a rotor, it is no longer necessary, as in the known device, to utilize a pulsating drive. Because a pulsating drive can be omitted, the placement of the dosing device in a dispensing machine is no longer critical. A further advantage is that in the diluted form of the concentrate, the so-called zebra effect does not arise because the concentrate is not dispensed in a pulsating manner.

Further, by virtue of the rotor, the dosing device can be of economically advantageous construction.

A further advantage of the device according to the invention is that metering can be set steplessly. Moreover, the dosing device can be designed with small overall dimensions. Furthermore, the rotor can be arranged such that the rotation axis is directed approximately parallel to the direction of the liquid flow path. Such a construction is easy to realize.

According to a preferred embodiment, the rotor is included in the liquid flow path. More particularly, the rotor is included in the liquid flow path upstream of the pump. In these cases, the rotor can also obtain the function of stirrer.

According to a preferred embodiment, the rotor is provided with a magnetizable material, such as soft iron. The rotor will then be magnetized under the influence of the changing magnetic field and proceed to orient in

that magnetic field. Because the magnetic field changes, the rotor will start to rotate.

In particular, the rotor comprises a plurality of arms extending in radial direction of the rotation axis. In the magnetic field the ends of these arms will each time be magnetized to form a north or a south pole. For that matter, the rotor can also take other forms. Essential is only that the rotor comprises poles which are magnetized under the influence of the magnetic field to form a north and a south pole. Thus the rotor can also be in the form of, for instance, a bar, an oval, etc.

Preferably, the pump is driven by the rotor by way of a drive shaft of which an axial axis is directed in the direction from the inlet to the outlet. This may provide overall small dimensions to the dosing device. Moreover, the construction is very reliable. As a dynamic liquid sealing of the drive shaft can be omitted, there is relatively little energy loss and there is a very small chance of leakage or contamination. A further advantage is that the concentrate remaining behind in the dosing device after use is hermetically sealed from the outside world.

What is also achieved by virtue of the specific direction of the drive shaft is that the dosing device can be placed in a dispensing machine rotation-independently. The position of the rotor is not critical then. If the dosing device is connected to a holder filled with the concentrate, this connection can likewise be effected rotation-independently.

According to the preferred embodiment, the dosing device comprises a substantially rotation-symmetrical housing of which an axial axis extends in the direction from the inlet to the outlet. In particular, the dosing device is provided, downstream of the pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value. The use of a pump in combination with a pressure relief valve has the advantage that no leakage flow owing to internal play arises in the non-driven condition. Moreover, the

valve provides for a microbiological sealing, which is important for beverages suitable for consumption.

Preferably, the pump is designed as a gear pump. Such a pump is very reliable and cheap and may provide a dosing device with small dimensions.

The holder according to the invention is characterized in that it is filled with the concentrate which in diluted condition is suitable for consumption, the holder being fitted with a dosing device according to the invention as described hereinbefore.

As the dosing device according to the invention, viewed in axial direction, can be made of low design, less length, viewed in this direction, is needed for driving than in the known linear magnet. This creates the possibility of making the dosing device extendible instead of foldable, so that a tearing strip in the holder, when it is designed as a so-called bag in box, can be omitted. This provides the advantage that making the box operational involves a simpler operation. In particular, accordingly, the holder is provided with a bag formed from flexible sheetlike material, in which the concentrate is contained, and a housing in which the bag is accommodated.

The invention also relates to an apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be charged with a holder as mentioned hereinbefore. The apparatus comprises a magnetization unit for generating at least one magnetic field which changes so as to drive the rotor to allow the dosing device to dispense concentrate from the holder in a metered manner. The apparatus further comprises means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption. The magnetization unit can be provided with a magnet and driving means for rotating a magnet for generating the changing magnetic field. It is also possible, however, that the magnetization unit is provided with a plurality of coils for generating the changing

magnetic field. The invention also relates to an assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder as described hereinbefore. The apparatus is adapted to be loaded with the holder, the apparatus comprising driving means for driving the dosing device to cause the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

The invention will presently be further explained with reference to the drawings, in which:

Fig. 1 shows an exploded view of a possible embodiment of a dosing device according to the invention, which is connected to a holder according to the invention. Fig. 1 also shows a magnetization unit of an apparatus for preparing a beverage suitable for consumption;

Fig. 2 shows a number of parts of the dosing device according to Fig. 1;

Fig. 3 shows a number of parts of the dosing device and the apparatus for preparing a beverage suitable for consumption according to Fig. 1;

Fig. 4a shows a top plan view of the gear pump of the dosing device according to Fig. 1;

Fig. 4b shows a cross section of the dosing device according to Fig. 1 which is placed in the magnetization unit of Fig. 1;

Fig. 5a shows a top plan view of the dosing device according to Fig. 1 which is placed in the magnetization unit according to Fig. 1;

Fig. 5b shows a view of the dosing device according to Fig. 1 which is placed in the magnetization unit according to Fig. 1; and

Fig. 6 shows a holder with a dosing device according to the invention, an apparatus for preparing a beverage suitable for consumption according to the invention, and an assembly comprising the apparatus and the holder according to the invention.

In Figs. 1-6, reference numeral 1 indicates a dosing device according to the invention. The dosing device comprises an inlet 2 and at least one outlet 4.

The liquid flow path extends from the inlet 2 to the outlet 4. In this example, the dosing device comprises a housing 6a and 6b composed of two parts, which is rotation-symmetrical around an axis which is directed in the direction of the liquid flow path.

In the housing 6a, 6b, a pump 8 is included. The pump 8 is here designed as a gear pump. At the top, the gear pump 8 comprises a covering plate 10 having an inflow opening 12. The inflow opening 12 is in fluid communication with a space where the teeth of, in this case two, gearwheels 14a and 14b mesh. The gearwheel 14b is driven by a drive shaft 16 which in mounted condition extends through an opening 18 of the covering plate 10. The gear pump 8 is provided at its underside with an outflow opening 20 for dispensing liquid. The drive shaft 16 is so directed that an axial axis of this drive shaft is directed in the direction from the inlet 2 to the outlet 4. In this example, the housing 6a, 6b is designed to be substantially rotation-symmetrical around the axial axis, likewise extending in the direction from the inlet 2 to the outlet 4.

In this example, the dosing device is provided, upstream of the gear pump 8, with a rotor 22 connected mechanically with the gear pump, in this example connected mechanically with the rotary shaft 16. In mounted condition, this rotor 22 is disposed above the covering plate 10. The rotor is adapted to be driven by means of a changing magnetic field, for the purpose of driving the gear pump 8.

In this example it holds, further, that the rotor 22 is included in the liquid flow path mentioned. In this example, the rotor is provided with a permanent magnet for contactlessly driving the rotor by means of at least one magnetic field. In particular it holds, in this example, that the rotor comprises a plurality of arms 24 extending in radial direction of the rotation

axis (drive shaft 16). More particularly, there are only two arms, disposed in line with each other and hence forming a beamlike body. The ends of the arms form poles of the permanent magnet mentioned. The poles of the permanent magnet will want to follow the changing magnetic field, which has as a result that the rotor and the drive shaft 16 will start to rotate. The device described up to this point works as follows. Suppose that the inlet 2 of the dosing device is connected to a holder 26, shown schematically in Figs. 1 and 6, in which an amount of concentrate, such as, for instance, coffee concentrate, is present. The holder 26, as shown best in Fig. 6, is fitted with the dosing device according to Fig. 1. In this example, the holder 26 includes a bag 28 (indicated by broken lines), formed by a flexible sheetlike material, in which the concentrate is contained, and a housing 30 in which the bag 28 is accommodated. The housing 30 is preferably made of substantially rigid design and hence is more rigid than the bag 28. The inlet 2 of the dosing device is in fluid communication with the inside of the bag 28. By presently generating a magnetic field changing in a predetermined manner, the rotor 22 will start to rotate in a predetermined manner. As a consequence, the gear pump 8 will likewise start to rotate, with the result that concentrate flows via the inflow opening 12 and the space between the teeth of the gearwheels to the outflow opening 20 mentioned. Thus the amount of concentrate dispensed in a metered manner corresponds with the angle of rotation through which the rotor 22 is rotated. The relation is substantially linear.

In Fig. 6, reference numeral 31 designates an apparatus for preparing a beverage suitable for consumption. The apparatus 31 is adapted to be loaded with the holder 26. The apparatus 31 comprises a magnetization unit 32 for generating the changing magnetic field referred to for driving the rotor. Further, the apparatus comprises means 34 for diluting the concentrate dispensed by the dosing device 1 with water. These means 34 comprise a hot water generator 36 and a mixing unit 38. In use,

the housing 6a, 6b of the dosing device is inserted through an opening 40 of the magnetization device, such that the outlet 4 of the dosing device reaches into an opening 42 of the mixing device 38. A control unit 44 of the apparatus 31 controls the magnetization unit 32 via line 45, such that a changing magnetic field is generated which causes the rotor 22 to rotate through a predetermined angle of rotation. As a result, from the holder 26 a predetermined amount of concentrate is dispensed to the mixing device 38. The control unit 44 also activates the hot water unit 36 and the mixing unit 38 via respective electrical lines 46 and 48. As a result, hot water is sent from the hot water unit 36 to the mixing unit 38. In the mixing unit, the hot water is mixed with the dispensed concentrate, after which the concentrate, in diluted condition and hence in the condition of a beverage suitable for consumption, leaves an outlet opening 50 of the apparatus 31.

In this example, the magnetization unit 32 comprises a plurality of coils 52 for generating the changing magnetic field.

The invention is not limited in any way to the embodiments outlined hereinabove. Thus, the rotor 22 may also be provided exclusively with soft iron. Magnetization of the rotor is then effected by the magnetic field of the magnetization unit 31. The rotor will want to orient in this changing magnetic field, so that the rotation is effected. The rotor 22 may also be driven, in a manner known per se, as is known for an eddy current motor. Upon rotation of the rotor, fly-back pulses arise in the coils 52 of the magnetization device which are not energized.

It is also possible that the coils 52 are replaced by permanent magnets, these magnets being mechanically rotated for generating the changing magnetic field.

Further, in the outflow opening 20 referred to, a valve 54 may be included which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value. This involves a so-called non-return valve comprising a shut-off member 56 with a spring 58 which is

schematically shown in this example . The valve 54 can also be designed as a so-called step valve.

In this example, the housing 6a and 6b is made of a suitable plastic. The gearwheels 14a and 14b and the drive shaft 16 are also made of plastic. The only metal part is therefore the rotor 22. It is also possible that the rotor is included in the liquid flow path downstream of the gear pump. Such variants are all understood to fall within the scope of the invention.

CLAIMS

1. A dosing device comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected, in use, to the storage space of the holder, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of a changing magnetic field, the rotor being mechanically connected to the pump for driving the pump with the rotating rotor.

2. A dosing device according to claim 1, characterized in that the rotor is included in the liquid flow path.

3. A dosing device according to claim 2, characterized in that the rotor is included in the liquid flow path upstream of the pump.

4. A dosing device according to any one of the preceding claims, characterized in that the rotor is provided with a magnetizable material such as soft iron.

5. A dosing device according to any one of the preceding claims, characterized in that the rotor comprises a permanent magnet for contactlessly driving the rotor by means of at least one magnetic field.

6. A dosing device according to any one of the preceding claims, characterized in that the rotor comprises a plurality of arms extending in radial direction of the rotation axis.

7. A dosing device according to claims 5 and 6, characterized in that the ends of the arms form poles of the permanent magnet.

8. A dosing device according to any one of the preceding claims, characterized in that the pump is driven by the rotor by way of a drive shaft of which an axial axis is directed in a direction from the inlet to the outlet .

9. A dosing device according to any one of the preceding claims, characterized in that the housing of the dosing device is of substantially rotation-symmetrical design, with an axial axis of the housing extending in the direction from the inlet to the outlet.

10. A dosing device according to any one of the preceding claims, characterized in that the dosing device is provided, downstream of the pump, with a valve included in the liquid flow path, which opens when the liquid pressure upstream of the valve exceeds a predetermined threshold value.

11. A dosing device according to any one of the preceding claims, characterized in that the pump is constructed as a gear pump.

12. A holder filled with concentrate which in diluted form is suitable for consumption, the holder comprising a dosing device according to any one of the preceding claims.

13. A holder according to claim 12, characterized in that the holder comprises a bag formed from a flexible sheetlike material in which the concentrate is contained, and a housing in which the bag is received.

14. A holder according to claim 13, characterized in that the inlet of the dosing device is connected to the bag.

15. A holder according to any one of claims 12-14, characterized in that the housing is of more rigid design than the bag.

16. An apparatus for preparing a beverage suitable for consumption, the apparatus being adapted to be loaded with a holder according to any one of the preceding claims 12-15 which is fitted with a dosing device according to any one of claims 1-11, the apparatus comprising a magnetization unit for generating at least one magnetic field changing such that the rotor is contactlessly driven by the magnetization unit for the dosing device to

dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

17. An apparatus according to claim 16, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

18. An apparatus according to claim 16, characterized in that the magnetization unit comprises a plurality of coils.

19. An assembly comprising an apparatus for preparing a beverage suitable for consumption and a holder according to any one of the preceding claims 12-15, the apparatus being loaded with the holder, and the apparatus comprising driving means for driving the dosing device for the dosing device to dispense concentrate from the holder in a metered manner, and means for diluting the dispensed concentrate with water for obtaining the beverage suitable for consumption.

20. An assembly according to claim 19, characterized in that the holder is detachably connected to the apparatus.

21. An assembly according to claim 19 or 20, wherein the holder comprises a dosing device according to any one of claims 1-11, characterized in that the apparatus further comprises a magnetization unit for generating at least one magnetic field changing such that the rotor is driven for causing the dosing device to dispense concentrate from the holder.

22. An assembly according to claim 21, characterized in that the magnetization unit comprises a magnet and driving means for rotating the magnet for generating the changing magnetic field.

23. An assembly according to claim 21, characterized in that the magnetization unit comprises a plurality of coils.

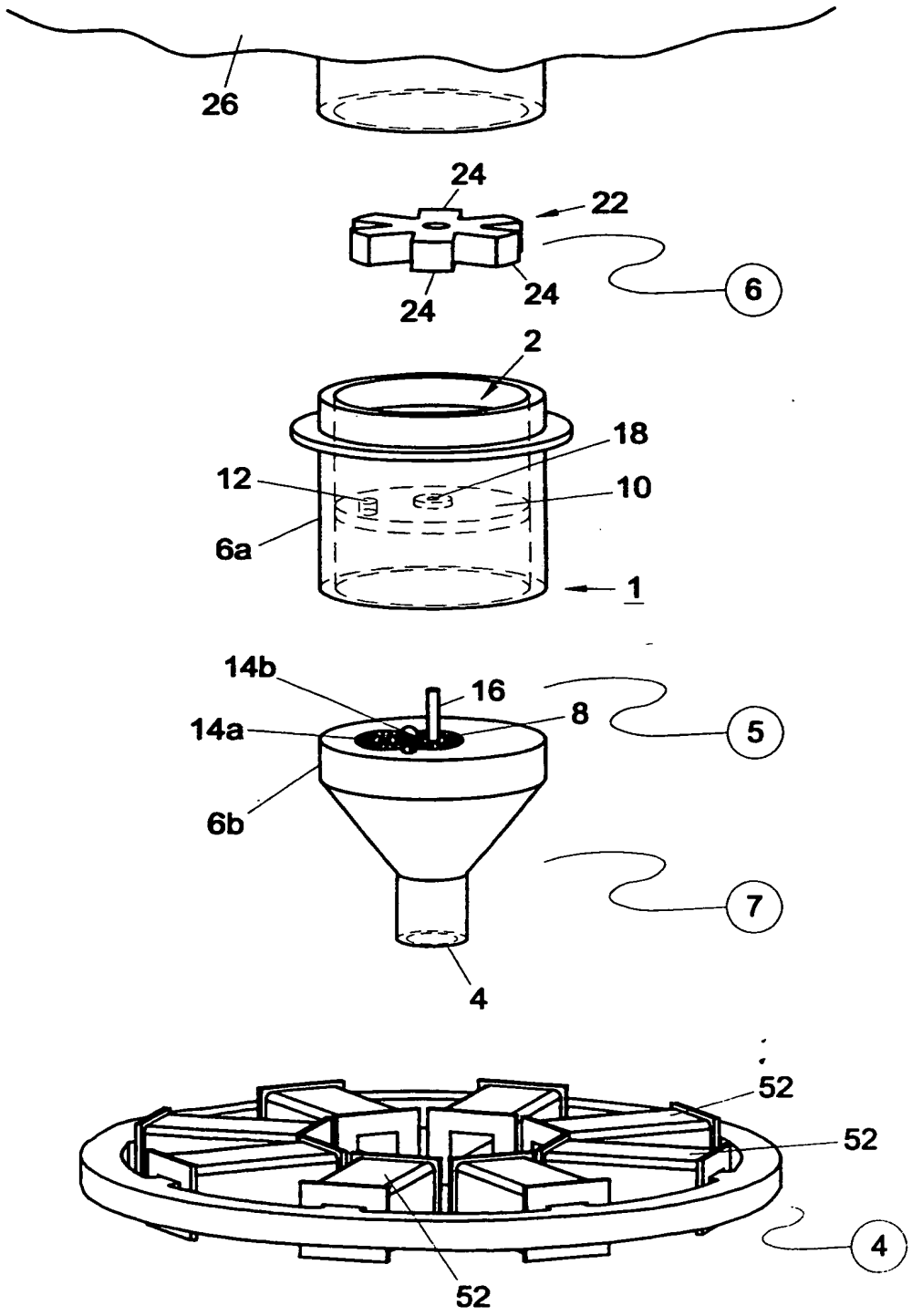

Fig. 1

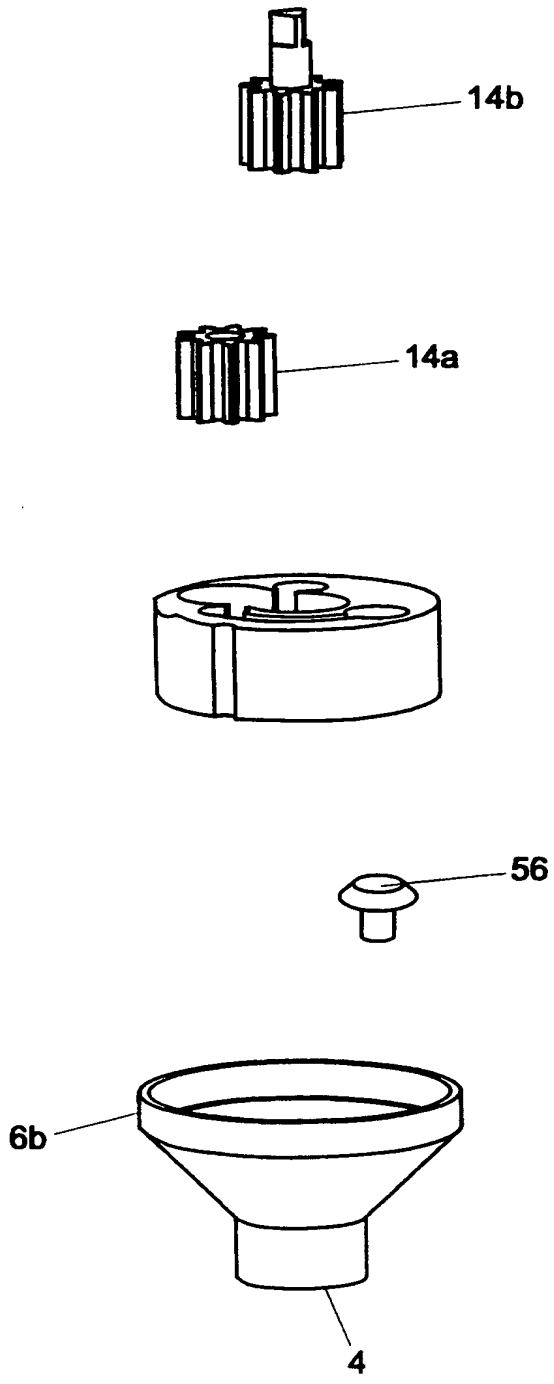

Fig. 2

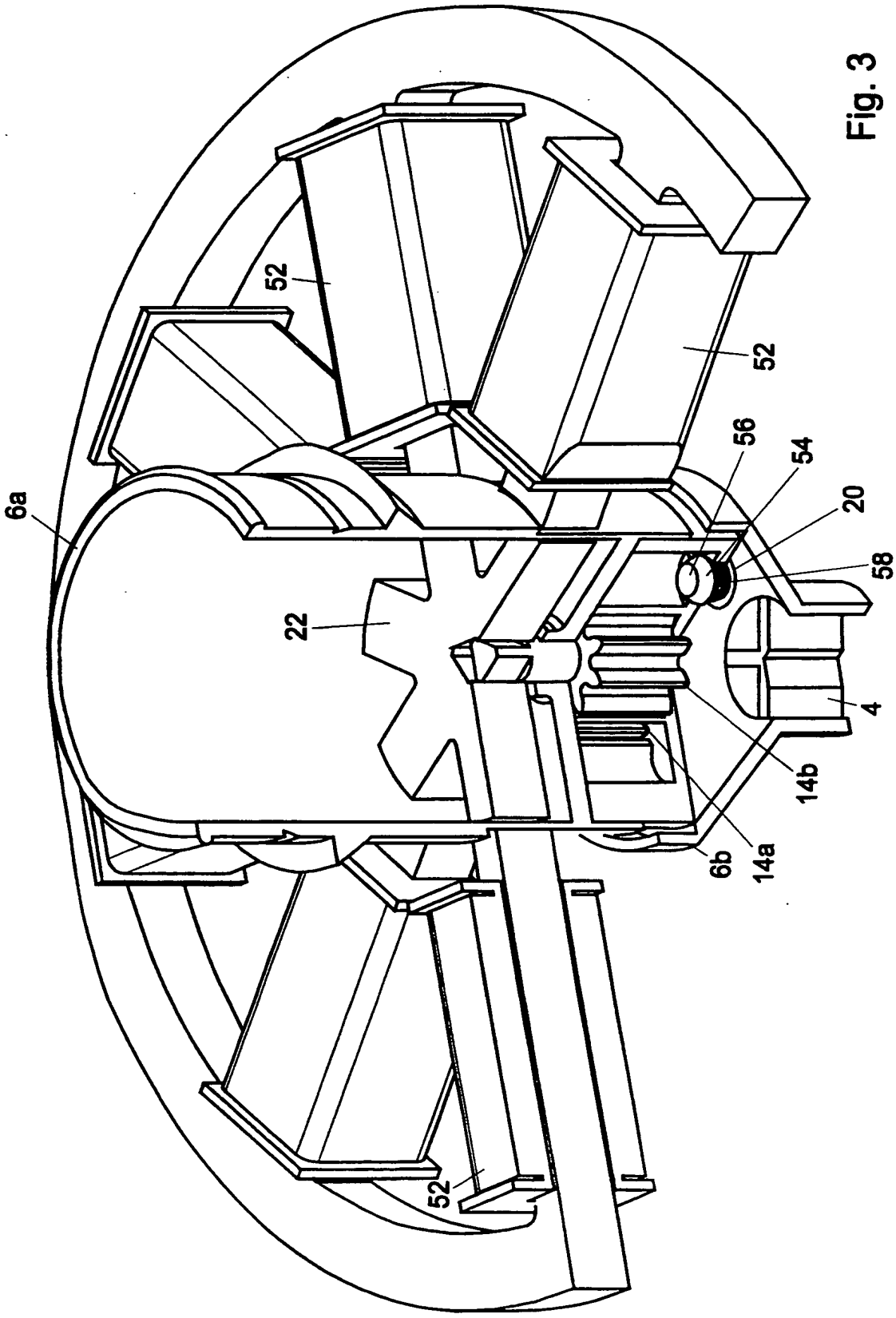

Fig. 3

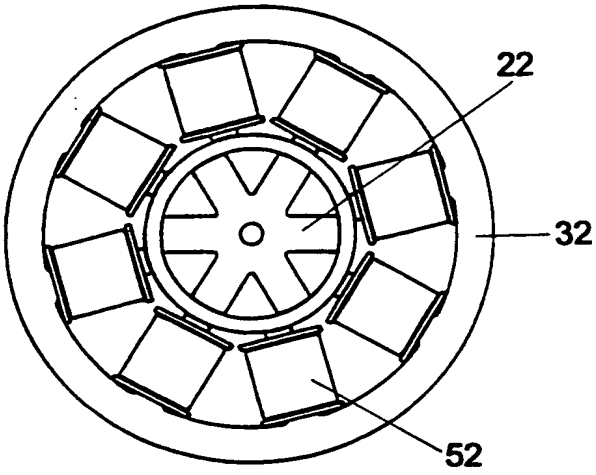

Fig. 5a

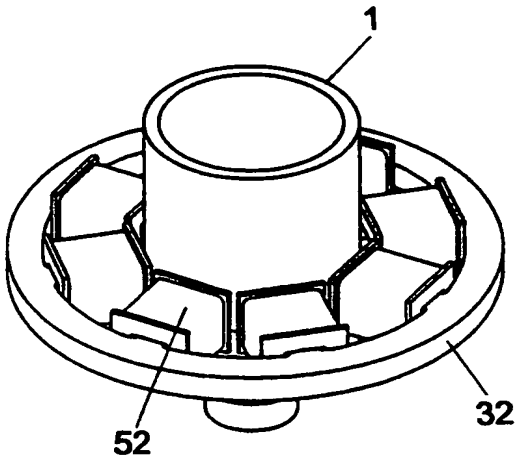

Fig. 5b

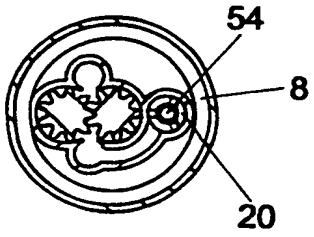

Fig. 4a

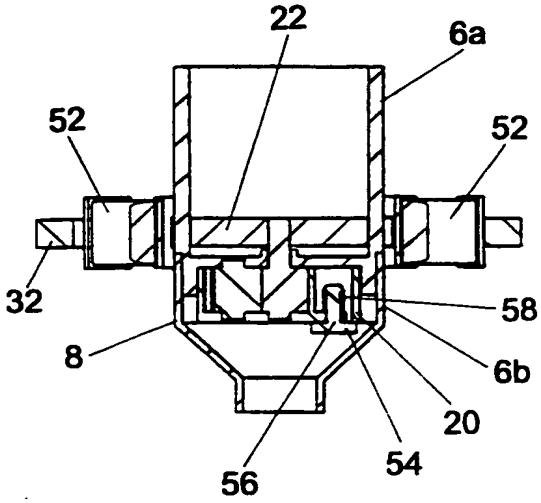

Fig. 4b

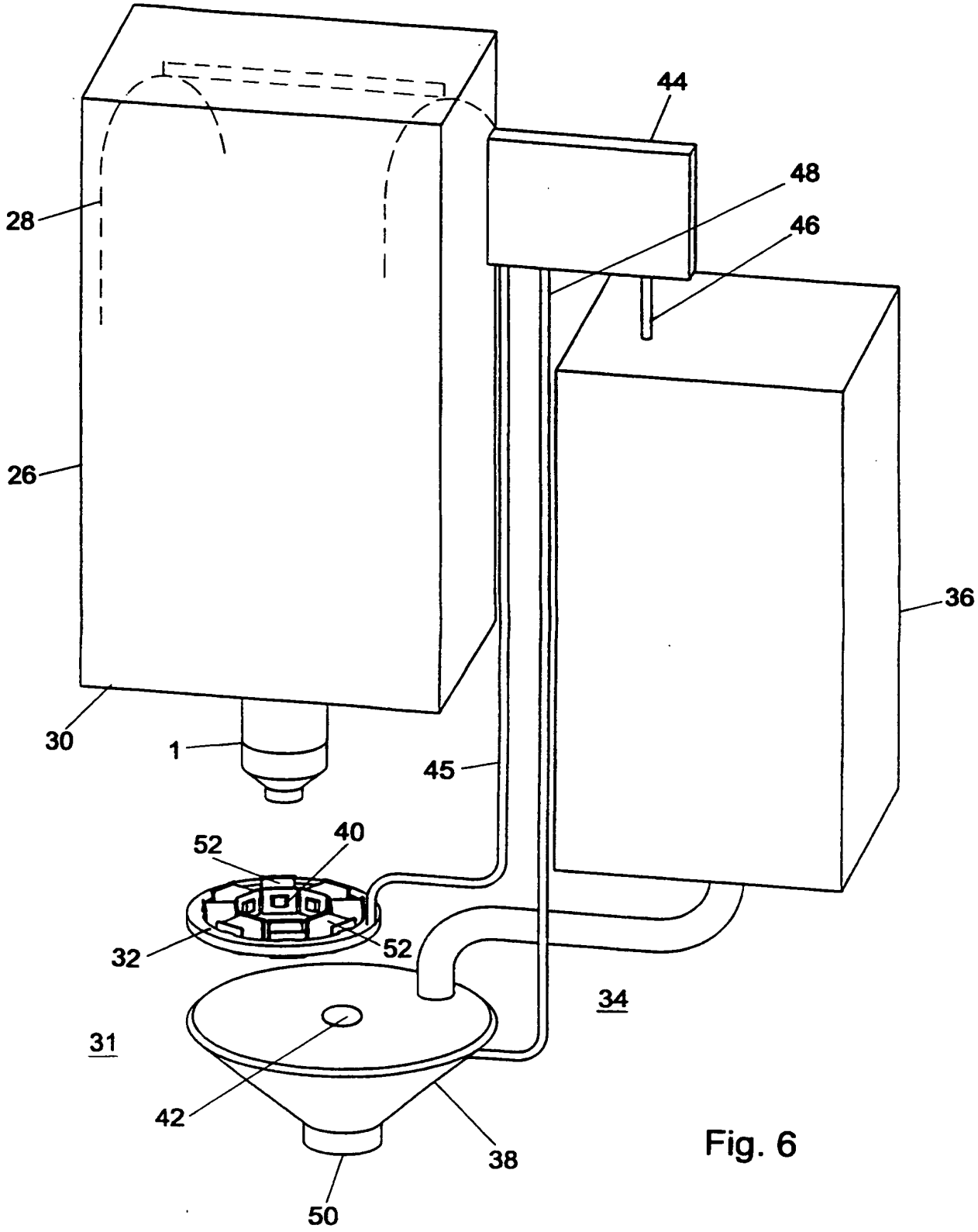

Fig. 6

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
P53579PC00		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/NL00/00428	20/06/2000	21/06/1999
International Patent Classification (IPC) or national classification and IPC		
G01F11/22		
Applicant		
Sara Lee/DE N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22/01/2001	15.10.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Van der Goot, D Telephone No. +49 89 2399 2562

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NL00/00428

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-9	as originally filed	

Claims, No.:

2-23	as originally filed	
1	with telefax of	24/09/2001

Drawings, sheets:

1/5-5/5	as originally filed	

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2,3,8-10
	No:	Claims	1,4-7,11-23
Inventive step (IS)	Yes:	Claims	2,3
	No:	Claims	1,4-23
Industrial applicability (IA)	Yes:	Claims	1-23
	No:	Claims	

2. Citations and explanations
   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Reference is made to the following document:

D1: US-A-5 836 482 (OPHARDT HEINER ET AL) 17 November 1998 (1998-11-17)

Section V

1. **Novelty (Art 33(2) PCT)**

1.1 As to the first part of claim 1, document D1, particularly figures 2-5 in conjunction with their description, discloses a dosing device for placement in a dispensing machine which comprises a magnetization unit (the stator of the electric motor 82) for generating a changing magnetic field, comprising a housing (54), an inlet (74), an outlet (76) and a pump (20) included in the liquid flow path between said inlet and said outlet for dispensing in a metered manner a viscous concentrate (see D1, column 1, lines 4-12) from a holder (18) comprising a storage space in which the concentrate is contained. The inlet (74) is adapted to be connected to the storage space of the holder.
As to the second part of claim 1 it is to be noted that D1 discloses the use of a conventional electric motor 82, which has a stator and a rotor, the latter being rotatably connected to the housing (54) for rotation around a rotation axis (80) and being mechanically connected to the pump for driving the same (see D1, column 5, line 31 to column 6, line 54 and figures 2 and 3).
Consequently all the features defined in claim 1 read on the disclosure of D1 and the claim thus lacks novelty over the disclosure of D1.

1.2 Dependent claims 4-7 contain additional features, which are implicit for electric motors, whereas the use of a gear pump (cf claim 11) is also known from D1 (see D1, fig. 4).
Likewise these claims lack novelty over D1.

2. **Inventive step (Article 33(3) PCT)**
Although D1 discloses a drive shaft perpendicular to the direction from the inlet to the outlet and a valve upstream of the pump, the direction of the drive shaft of the pump along the direction from the inlet to the outlet (cf claims 8-9) and the position of a valve downstream of the pump (cf claim 10) are considered to be

design options which may be selected in accordance with circumstances without the exercise of inventive skill.
The subject matter of claims 8-10 therefore lack an inventive step over the disclosure of D1.

3. Claims 12-23 are related to a holder, apparatus and assembly comprising the dosing device according to any of the claims 1-11. The features of the holder, apparatus and assembly are known from D1 (see figures 1, 2 and 6) or are considered to be implicit in electric motors.
Mutatis mutandis the claims 12-23 lack novelty/inventive step for the same reasons as set out above with respect to claims 1 and 4-11.

4. None of the documents cited in the international search report discloses or hints at a rotor included in the liquid flow path as defined in claims 2 and 3. These claims are therefore considered to meet the requirements of novelty and inventive step pursuant to Art. 33(2) and 33(3) PCT. However for a clear definition of the dosing device (article 6 PCT) and in view of the **sole** embodiment given in figures 1 to 6 of the drawings, the feature that the rotor is contactlessly driven by a magnetization unit (32, 52) **positioned around the housing** of the dosing device and arranged to generate a changing magnetic field to drive said rotor, as shown in figures 1, 3, 4 and 5 of the drawings, should be included in claim 2.

Section VII

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Claims

1. A dosing device for placement in a dispensing machine which comprises a magnetization unit for generating a changing magnetic field, comprising a housing comprising at least one inlet, at least one outlet, a liquid flow path extending from the inlet to the outlet, and a pump included in the liquid flow path, the dosing device being adapted for dispensing in a metered manner a viscous concentrate from a holder in which the concentrate is contained, the concentrate in diluted form giving a product suitable for consumption, the holder comprising a storage space in which the concentrate is contained, and the inlet of the dosing device being adapted to be connected , in use, to the storage space of the holder, characterized in that the dosing device comprises a rotor rotatably connected to the housing for rotation around a rotation axis, for causing the rotor to rotate about the rotation axis by means of the changing magnetic field, the rotor being mechanically connected to the pump for driving the pump with the rotating rotor.